SeaChanger

Installation and Operation Manual

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A HALMA GROUP COMPANY

FCC Information

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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Important Safety and Warranty Notices

Safety Information

Please read all instructions prior to assembling, mounting, and operating this equipment.

Product Modification Warning

Ocean Optics products are designed and manufactured to meet the requirements of United States and International safety regulations. Modifications to the product could affect safety and render the product noncompliant to relevant safety standards.

Warranty Information

Limited Warranty

Unless otherwise stated, your *product unit* is covered by a one-year parts and labor limited warranty. Dichroic filters are not guaranteed against breakage or scratches to coating. It is the owner's responsibility to furnish receipts or invoices for verification of purchase, date, and dealer or distributor. If purchase date cannot be provided, date of manufacture will be used to determine warranty period.

Returning an Item Under Warranty for Repair

It is necessary to obtain a Return Material Authorization (RMA) number from your dealer or point of purchase BEFORE any units are returned for repair. The manufacturer will make the final determination as to whether or not the unit is covered by warranty. Lamps are covered by the lamp manufacturer's warranty.

All product units or parts returned to Ocean Optics must be packaged in a suitable manner to ensure the protection of such product units or parts. This packaging must be clearly and prominently marked to indicate that the package contains returned product units or parts and must also display its RMA number. Accompany all returned product units or parts with a written explanation of the alleged problem or malfunction. Ship returned product units or parts to: Ocean Optics, 8060A Bryan Dairy Road, Largo, Florida, 33777.

Note

Freight damage claims are invalid for fixtures shipped in non-factory boxes and packing materials.

Freight

All shipping charges will be paid by the purchaser. Items under warranty shall have return shipping paid by the manufacturer only in the continental United States. Under no circumstances will freight collect shipments be accepted. Prepaid shipping does not include rush expediting such as air freight. Air freight can be sent customer collect in the continental United States.

REPAIR OR REPLACEMENT AS PROVIDED FOR UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. OCEAN OPTICS, INC. MAKES NO WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO ANY PRODUCT, AND OCEAN OPTICS SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Warranty is void if the product is misused, damaged, modified in any way, or for unauthorized repairs or parts. This warranty gives you specific legal rights; you may also have other rights, which vary from state to state.

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About This Manual

Document Purpose and Intended Audience

This document provides you with an installation section to get your SeaChanger up and running.

Document Summary

Chapter	Description
Chapter 1: *Features*	Provides a list of product features.
Chapter 2: *Setup and Configuration*	Contains instructions for unpacking, installing and configuring the SeaChanger.
Chapter 3: *Operation*	Contains instructions for using the SeaChanger.
Appendix A: *SeaChanger Specifications*	Provides product specifications.
Appendix B: *Maintenance*	Provides for cleaning the SeaChanger dichroics.

Product-Related Documentation

You can access documentation for SeaChanger by visiting our website at **www.OceanOnStage.com**.

Upgrades

Occasionally, you may find that you need Ocean Optics to make a change or an upgrade to your system. To facilitate these changes, you must first contact Customer Service and obtain a Return Merchandise Authorization (RMA) number. Please contact Ocean Optics for specific instructions when returning a product.

Chapter 1

Features

SeaChanger Color Engine

The SeaChanger Color Engine is an innovative dichroic color-mixing accessory for the ETC™ Source Four™ ellipsoidal fixture. SeaChanger gives you the freedom to mix any color as well as perform live fades from one color to another smoothly, silently, and cleanly.

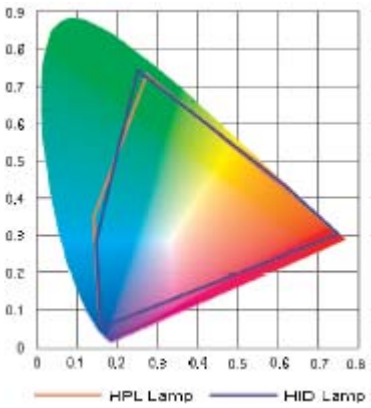
SeaChanger attaches between the rear housing assembly and the front barrel assembly of the Source Four, and does not interfere with the gate area. You can still use patterns, irises, gobo changers, and all the usual accessories with your Source Four fixture.

SeaChanger uses dichroic borosilicate glass, which will not fade or change color. So, the color you create during rehearsals is the same color you will see a week, a month, or a year later. And, there are no gel scrolls to burn out or replace.

SeaChanger Features

Your SeaChanger Color Engine offers the following features:

- Easy installation – Locks on to existing bayonet lens mount with no modifications
- High-efficiency dichroics – Less light loss with dichroic color than with a gel
- No interference with Source Four optics – Can be used with any lens type
- Smooth color mixing – Includes pastel and saturated colors
- Fully dichroic colors that never fade
- Full control over color mixing from smooth, stepless movement to rapid color changes – Allows slow, imperceptible color fades
- Silent operation – Contains no fans
- Live color fading from one color to another at any speed with no strange, intermediate colors
- No interference with Source Four's gobos, irises, or gobo rotators
- Operates on 6 DMX channels: Cyan, Yellow, Magenta (CYM), and Dimmer



SeaChanger Color Gamut

Chapter 2

Setup and Configuration

Unpacking the Products

Unpack your SeaChanger products and verify that they are undamaged. If there is no damage, continue with the rest of the setup procedure (see ***SeaChanger Setup***). If there is damage, notify both the shipping agent and the sales agent immediately.

Save the shipping carton and packing materials. The carton and packing materials are specifically designed to protect the product during transport. Return a product for repair in its original shipping carton and packing materials. Ocean Optics assumes no responsibility for products that are damaged during transport. Before returning anything to the factory, call for a Return Material Authorization (RMA) number. Ocean Optics cannot accept any goods shipped without an RMA number. See ***Returning an Item Under Warranty for Repair***.

Package Contents

The SeaChanger Color Engine ships with the following items:

- User manual
- Safety cable

Optional Accessories

The following accessories are available from Ocean Optics:

- Extended Yoke for down lighting or FOH installations (Part No. ME451-59)

SeaChanger Setup

Setting up the SeaChanger involves installing the proper power cord cap and setting the DMX start channels.

Installing a Power Cord Cap

Your SeaChanger ships with a power cord that must be connected to a standard cord cap. Different locations may require a different power cord cap to connect the fixture to a power source. Because of the variety of power cord caps used worldwide, Ocean Optics, Inc. cannot make specific recommendations for the power cord cap. Contact a local authority for the type of power cord cap needed.

The SeaChanger has a universal power supply onboard that allows for connection to a wide variety of main power sources. Refer to the Specifications section for details.

When installing the power cord cap, note that the cores in the mains lead are colored in accordance with the following code:

Color	Function
Green with Yellow stripe	Ground
Blue	Neutral
Brown	Live

WARNING

The SeaChanger is Class 1 equipment. This equipment must be connected to an earth ground.

Note

Maximum total color- changer cable length per SeaChanger should not exceed 600 ft. (182.9 m).

Mounting the SeaChanger on a Source Four Ellipsoidal Fixture

The SeaChanger requires no tools to install. It fits between the lamp and the lens module of the Source Four Ellipsoidal fixture. Perform this procedure *before* you connect the fixture to power.

WARNING

INTENSE HEAT. AVOID CONTACT BY PERSONS AND MATERIALS.

► *Procedure*

To install a SeaChanger Color Engine in a Source Four ellipsoidal fixture,

1. Remove the Source Four from the yoke assembly, setting aside the screws to use in Step 2.
2. Using the same screws, attach the SeaChanger as shown in the figure below. Adjust the SeaChanger to the desired orientation.

2. Remove the front barrel assembly of the Source Four ellipsoidal fixture by loosening the thumbscrew and the Philips set screw located above and beneath the lens barrel. Rotate the barrel assembly until it releases from the mounting tabs located in the rear housing assembly.
3. Insert the SeaChanger into the Source Four rear housing assembly by aligning the mounting tabs into the rear-locking ring of the SeaChanger. You must rotate the rear housing until the Source Four mounting tabs are captured in the SeaChanger locking ring channels. Tighten the thumbscrew and Philips set screw to lock the module onto the Source Four fixture.
5. Insert the front barrel assembly onto the front locking ring of the SeaChanger, engaging the barrel assembly into the locking ring channels.
6. Adjust the front barrel assembly to the desired orientation and tighten the thumbscrew and Philips set screw to lock the front barrel assembly to the SeaChanger.
7. Mount the unit using safety cable at the mounting location.

Optimizing Performance

Soft Edge Beam

For optimum performance from SeaChanger and the Source Four when you need a soft edge, always move the lens tube out (away from the lamp housing) from the focus point, not towards.

Determining a Valid DMX Base Address

The DMX base address (start channel) identifies each fixture on a link for the DMX controller. There are 512 available channels on each DMX link. These 512 channels are divided among *all* the devices on a particular link. The number of channels a fixture requires is called the fixture's channel range. The DMX base address assigned to a particular fixture is the first channel available to a fixture in its channel range. The fixture's channel range must not overlap any other device's channel range on the link. When two devices on the same DMX link have overlapping channel ranges, one or both devices will be disabled or behave erratically.

Remember the following criteria when determining a valid base address:

- The base address is the number of the first channel in a consecutive block of channels assigned to an individual fixture.
- If you want two or more fixtures to respond to controller commands in exactly the same way, you can assign them the same base address. In that case, those fixtures must be the same type and must share the *entire* channel range.
- A fixture can be assigned the second block of DMX channels on a link without physically being the second fixture on the link.
- To avoid overlapping channels, place the start channel at the beginning of a range of available channels large enough to accommodate that fixture type.
- Every channel in the link does not need to be assigned.
- The channel range required for a fixture differs depending on the fixture type.

Setting the SeaChanger DMX Base Address

The SeaChanger Color Engine requires six DMX channels. Choose a DMX base address that precedes the base address of any fixture the console controls.

► *Procedure*

To set the SeaChanger Start channel:

1. Use the front panel buttons and LED numeric display to select the three digit base address. The displayed address will become active after a three second delay.

Chapter 3

Operation

Overview

The SeaChanger can be operated by a DMX512 controller, RDM (Remote Device Management) device, or from the front panel display.

Power and DMX Connections

The SeaChanger has a self-contained universal AC/DC power supply, permitting connection to single-phase power sources with a voltage range of 90 – 264 VAC, at a frequency of 50 – 60 Hz.

The DMX I/O connectors are 5-pin XLR type, and are connected in a pass-through arrangement to enable daisy chaining of multiple fixtures. Either connector can function as an input or output. An external terminator plug (not supplied) is recommended for the last fixture in a DMX cable run.

SeaChanger Display and Control Buttons

The SeaChanger features a 3-digit LED display and corresponding panel buttons for numeric entry. Each button push increments the corresponding digit by 1, and from 9 back to 0. Addresses and functions programmed via the display panel take effect after a 3 second delay.

DMX Signal Indicator

The SeaChanger display will show a decimal point if a DMX signal is present. The decimal point will go out when signal is not present or removed.

Display Blanking

The SeaChanger display will blank the digits after a 5-minute delay. The DMX signal indicator (decimal point) will remain on as long as a DMX signal is present. The display can be powered on by pushing any of the display buttons once while blanked.

USITT DMX512-A Manufacturer ID

All Ocean Optics DMX512 addressable fixtures have an ESTA registered Manufacturer's ID of ASCII "SC" (decimal 83 & 67, or 53h 43h in hex).

Setting the Base DMX Address

The SeaChanger is a six channel DMX device, and requires that a contiguous block of six DMX addresses be available. The display panel or RDM input is used to enter the DMX base address of the fixture. Channel 1 is assigned to this base address, and Channels 2 through 6 are assigned the next five DMX addresses.

DMX Control

When connected to a suitable DMX controller, the SeaChanger can be operated via six DMX channels. The channels are assigned as in Table 1 below:

Table 1 – SeaChanger DMX Channel Map

Channel	Name	Parameter	Percent Range	DMX Range	Hex Range	Reset Default Percent Value
1	Cyan	Color Saturation	0 – 100%	0 – 255	0 – FF	0% Full clear
2	Magenta	Color Saturation	0 – 100%	0 – 255	0 – FF	0% Full clear
3	Yellow	Color Saturation	0 – 100%	0 – 255	0 – FF	0% Full clear
4*	Dimmer	Fixture Brightness	0 – 100%	0 – 255	0 – FF	100% Full bright
	Extreme Magenta	Color Saturation	0 – 100%	0 – 255	0 – FF	0% Full clear
	CTO	Color Correction	0 – 100%	0 – 255	0 – FF	0% Full clear
	CTB	Color Correction	0 – 100%	0 – 255	0 – FF	0% Full clear
5	Speed	Wheel Velocity	0 – 100%	0 – 255	0 – FF	Last programmed
6	Control (Functions activate after a 3 second hold in range and return to 0 value)	Reset Cyan	16 – 18%	41 – 47	29 – 2f	0%
		Reset Magenta	20 – 22%	51 – 57	33 – 37	
		Reset Yellow	24 – 26%	61 – 67	3d – 43	
		Reset Dimmer	28 – 30%	71 – 77	47 – 4d	
		Reset All	32 – 34%	81 – 87	51 – 57	
		Start Demo Mode	71 – 73%	181 – 187	b5 – bb	

Note

* Depending on your SeaChanger configuration, the wheel in position 4 may differ. The tables indicate the settings for the various optional wheels.

RDM Communication

The SeaChanger is RDM (Remote Device Management) compliant to BSR 1.20, draft standard 2.1. RDM allows the SeaChanger base DMX address to be remotely set, and the operating mode or fixture settings to be changed. Table 2 below lists the available functions via RDM:

Table 2 – SeaChanger RDM Control

RDM Input	Function	Type
001 - 512	Set Fixture Base Address	Modal
700	Autoflip Display	Action
701	Display Normal & Lock	Action
702	Display Invert & Lock	Action
800	Start Demo Mode	Modal
900	All in Full	Modal
901	Cyan Full	Modal
902	Magenta Full	Modal
903	Yellow Full	Modal
904	Wheel 4 Full	Modal
905	Red (Magenta + Yellow)	Modal
906	Green (Cyan + Yellow)	Modal
907	Blue (Cyan + Magenta)	Modal
908	Lavender Tint L003	Modal
909	Med Bastard Amber L004	Modal
910	Orange L104	Modal
911	Fluorescent Green L219	Modal
912	Pale Lavender L136	Modal
913	No Color Blue L144	Modal
914	Pale Rose L154	Modal
915	Bastard Amber L162	Modal
916	Flame Red L164	Modal
917	Light Red L182	Modal
918	Rose Purple L048	Modal
919	Kelly Green R084	Modal
920	Billington Pink R336	Modal
921	Sea Blue R071	Modal
922	Plasa Red L029	Modal
923	Mayan Sun R318	Modal
924	Surprise Pink R051	Modal
925	Congo Blue R382	Modal
990	Reset All Home Position	Action
991	Reset Cyan Home Position	Action
992	Reset Magenta Home Position	Action
993	Reset Yellow Home Position	Action
994	Reset Wheel 4 Home Position	Action
Modal functions remain in effect until another is selected. Actions return to the current mode after execution. Gel Match functions 908 – 925 are based on Ushio HPL 575/WC/120V lamp. **Functions take effect after a 3 second delay.**		

Direct Panel Entry

The SeaChanger display panel provides a means to set the fixture base address, select the operating mode, and program settings. These parameters are shown in Table 3 below:

Table 3 – SeaChanger Direct Panel Entry

Display Input	Function	Type
001 - 507	Set Fixture Base Address	Modal
700	Autoflip Display	Action
701	Display Normal & Lock	Action
702	Display Invert & Lock	Action
800	Start Demo Mode	Modal
900	All in Full	Modal
901	Cyan Full	Modal
902	Magenta Full	Modal
903	Yellow Full	Modal
904	Wheel 4 Full	Modal
905	Red (Magenta + Yellow)	Modal
906	Green (Cyan + Yellow)	Modal
907	Blue (Cyan + Magenta)	Modal
908	Lavender Tint L003	Modal
909	Med Bastard Amber L004	Modal
910	Orange L104	Modal
911	Fluorescent Green L219	Modal
912	Pale Lavender L136	Modal
913	No Color Blue L144	Modal
914	Pale Rose L154	Modal
915	Bastard Amber L162	Modal
916	Flame Red L164	Modal
917	Light Red L182	Modal
918	Rose Purple L048	Modal
919	Kelly Green R084	Modal
920	Billington Pink R336	Modal
921	Sea Blue R071	Modal
922	Plasa Red L029	Modal
923	Mayan Sun R318	Modal
924	Surprise Pink R051	Modal
925	Congo Blue R382	Modal
990	Reset All Home Position	Action
991	Reset Cyan Home Position	Action
992	Reset Magenta Home Position	Action
993	Reset Yellow Home Position	Action
994	Reset Wheel 4 Home Position	Action
Modal functions remain in effect until another is selected. Actions return to the current mode after execution. Gel Match functions 908 – 925 are based on Ushio HPL 575/WC/120V lamp. **Functions take effect after a 3 second delay.**		

Demo Mode

The SeaChanger demo mode provides for color changing without a DMX controller attached. Selection of “800” via RDM or direct entry starts the demo mode. The fixture will sequence through the colors in Table 4 below, with a four second dwell time at each color. Custom demo color tables are available at the time of order; please contact Ocean Optics for more information.

Table 4 – SeaChanger Demo Colors

Sequence Number	Function	RDM/Display Equivalent
1	Cyan	901
2	Magenta	902
3	Yellow	903
4	Red	905
5	Green	906
6	Blue	907
7	Lavender Tint L003	908
8	Med Bastard Amber L004	909
9	Orange L104	910
10	Fluorescent Green L219	911
11	Pale Lavender L136	912
12	No Color Blue L144	913
13	Pale Rose L154	914
14	Bastard Amber L162	915
15	Flame Red L164	916
16	Light Red L182	917
17	Rose Purple L048	918
18	Kelly Green R084	919
19	Billington Pink R336	920
20	Sea Blue R071	921
21	Plasa Red L029	922
22	Mayan Sun R318	923
23	Surprise Pink R051	924
24	Congo Blue R382	925
Gel Match demo colors 7 - 24 are based on Ushio HPL 575/WC/120V lamp.		

For convenience, demo mode can also be started from a connected DMX controller via the control channel. Please refer to Table 1 for details.

To cancel demo mode, select a DMX base address between 1 and 507.

Appendix A

SeaChanger Specifications

Specification	Value
Mechanical	
Height	280 mm (11.0 in.)
Width	170 mm (6.7 in.)
Depth	259 mm (10.2 in.)
Shipping Weight	6.4 kg (14 lbs.)
Actual Product Weight	5.4 kg (12 lbs.)
Electrical	Non-dimming circuit 90 - 264 VAC / 12- 370 VDC 47 - 440 Hz 1.4 Amps @ 120 VAC, 0.7 Amps @ 230 VAC Fuse: Type UL/EC127 250 VAC H 3.15A
Environmental	
Maximum Ambient Temperature	40 °C (104 °F)
Minimum Ambient Temperature	0 °C (32 °F)
Maximum Exterior Surface Temperature*	200 °C (392 °F)
Lamp	
Type*	HPL or HID lamp
Cabling and Terminator	
SeaChanger Data Link	5-Pin XLR DMX cable
Maximum Recommended Cable Length	182.9 m (600 ft.)
Compatible Terminator	120 ohms
* *For more information, see the documentation for the ETC™ Source Four™ fixture*	

Appendix B

Maintenance

Cleaning the SeaChanger Dichroics

WARNINGS

Disconnect power and turn power switch off before servicing.

Equipment surfaces may reach temperatures up to 67° C (153° F). Allow the fixture to cool before handling.

Clean the Dichroic glass using a mild glass cleaner (containing no ammonia) and a soft, lint-free cotton cloth.

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